

DESIGNING MEDIA AND ICT STRATEGIES FOR NON-FORMAL EDUCATION IN ERITREA

C.S.H.N. Murthy

*Department of Adult and Media Education,
Government of Eritrea*

ABSTRACT

Designing media and ICT strategies for a newly formed country like Eritrea, which has endured 30 years of armed struggle, leading to massive destruction followed by serial drought, is fraught with numerous constraints: limitation of human resources (e.g. qualified personnel), infrastructure and financial constraints. At the same time, though it may seem paradoxical, there is an inescapable urgency to generate media and ICT strategies, limitations notwithstanding, to turn out larger groups of people capable of leading the nation from illiteracy and poverty to literacy and greener pastures of a developed economy. A three-pronged effort is directed to cover all target groups and key players – one each towards categorised target groups and the other towards the training of radio and television personnel. It has to be followed by sensitising the government, another major key player in the whole process, to lay down required media education policy and to see to its sustainability. Conceived as the first-ever original and creative document, subject to further refinements as experience of its implementation pours in, what follows is the presentation of major principles that went into development of media education, facilitating direct teaching and enrichment, and quicker and low cost curricular reforms, in order to achieve rapid transformation and poverty reduction in Eritrea.

Keywords: access, equity, relevance, quality, gender parity and gender development education sector development programme, rapid educational transformation, education for all, millennium development goals, i-poverty reduction, Eritrea, Eritrean National Education Policy, media education, direct teaching, enrichment through media, formal and non-formal education, adult education, categorisation of learner groups, curricular reforms

Introduction

Eritrea became independent on May 24, 1993 after a protracted armed struggle for over 30 years against the federation rule of Ethiopia. It is a tiny country on the north-easternmost border of Africa, adjoining the Red Sea, with a population of about 4.8 million distributed across a vast expanse of an uneven terrain divided into upper highlands and lower western and eastern lands (ORC, 2003). The population density is about 39 per square kilometer, with villages being located on the slopes of the rugged hills and situated quite far from each other, making ordinary human transport a most formidable task. Most of the people are dependent on agriculture and pastoralism, though only 5 per cent of land is under cultivation, which is mostly monsoon dependent, though the government has constructed a number of check dams and small reservoirs in the last five years to prevent the draining of monsoon rainwater down the hills. However the per capita income is less than US\$200 per annum, making Eritrea one of the most aid-dependent countries in the World (see Tables 1–6). The country's literacy stands at 58 per cent, with over 60 per cent of women being illiterate (CIA, 2006). This itself suggests a sign of improvement and progress, as the literacy level at the time of independence was somewhere around 20–30 per cent, though a scientific census has never been conducted.

The country's economy, which had been recovering since independence, has been badly hit by serial drought, poor monsoon and a devastating war with Ethiopia over a border issue between 1998 and 2000. Hence, whatever reforms and development goals the Government of Eritrea had planned and implemented up to 1998 under its 'Macro' policy 1994 suffered terrible reversals and GDP growth declined from 7 per cent to 3 per cent (see Tables 4, 5). In the post-conflict scenario, the government has

Table 1: Eritrea: demographic indicators estimated for 2000 to 2020

	2000	2005	2010	2015	2020
Population in millions					
(% increase since 2000)	4.10	4.60 (12%)	5.10 (24%)	5.60 (37%)	6.20 (51%)
Population growth rate (%)	2.3	2.1	2.0	1.9	1.6
<i>Population by age groups ('000s)</i>					
0–4	730	760	810	870	930
5–9	610	710	740	800	860
10–14	520	600	700	740	790
Sub total	1,860	2,070	2,250	2,410	2,570
15–19	420	510	590	690	730
20–64	1,710	1,530	3,950	2,630	3,100
65+	110	120	140	170	198
Total	4,100	4,650	5,220	4,880	6,610
Dependency ratio % ^a	100	97	91	81	74
Of which under-15 group %	90	88	81	72	65
Women of childbearing age (15–49)	21%	23%	24%	25%	26%
Labour force participation (15–60)	50%	51%	53%	55%	58%

Note: ^a Dependency ratio is population under 15 and over 64 divided by the 15–64 age group population.

Source: World Development Indicators 2001

Table 2: Eritrea: Key economic indicators 1993–2001

	1993 1997	1998	1999	2000	2001	1998 2001
Real GDP growth (%)	4.9	3.9	-1.5	-10.9	9.1	0.2
Inflation (% change, end of year)	9.1	9	10.6	26.8	7.7	13.5
Gross National Savings/GDP (%)	39.4	12.0	13.7	19.1	21.1	16.5
Income per capita (US\$)	200	207.6	191.7	173.8	175.0	187
Gvt Expenditure/GDP (%)	63.5	81.8	99.6	101.4	78.1	90.2
Gvt Domestic debt (net)/GDP (%)	34.3	63.4	98.8	127.5	105.9	98.9
Net donor support/GDP (%)	12.3	17.3	27.1	24.3	33.7	25.6

Source: IMF, World Bank Database

Table 3: Breakdown of Eritrean government and donor contribution to education costs, 1993–2000

Year	Spending on Basic and Secondary Education					University of Asmara		
	Total spending	Capital spending	Donors' contribution	Donor contribution % of total	% of capital spending	Total spending US\$m	Donors' contribution US\$m	% donors' contribution
	US\$m	US\$m	US\$m	spending	spending			
1993	10.8	2.5	2.5	23.1	100.0	0.9	0.3	32
1998	33.9	9.3	7.1	20.9	76.3	3.6	1.7	46
1999	34.9	13.4	9.7	27.8	72.4	4.2	2.3	56
2000	26.8	8.3	7.1	26.5	85.5	3.5	1.8	51

Source: Eritrea Ministry of Education and Ministry of Finance; Source: Eritrea Education and Training Sector Note: World Bank Document No. 24448-ERI-A-2002

Table 4: Eritrea: Macroeconomic consequences of the war (1998–2000)

1993	1994	1995	1996	1997	1993– 1997	1998	1999	2000	2001	1998– 2001
<i>Income per capita</i>										
NA	NA	180	200	220	200	207.6	191.7	173.8	175.0	187
<i>Government expenditure/GDP (%)</i>										
61.8	59.3	69.2	65.9	55.4	63.5	81.8	99.6	101.4	78.1	90.2
<i>Government domestic debt (net)/GDP (%)</i>										
NA	NA	NA	NA	34.3	34.3	63.4	98.8	127.5	105.9	98.9
<i>External public debt/GDP (%)</i>										
0.5	4.8	5.7	6.2	11.7	7.9	19.8	39.8	51.7	60.9	43.1
<i>Private transfer/GDP (%)</i>										
40.5	56.7	37.6	38.9	54.6	43.7	34.7	36.9	32.2	26.5	32.6
<i>Net donor support/GDP (%)</i>										
17.6	21.4	13.8	13.8	12.4	13.3	17.3	27.1	24.3	33.7	25.6

Source: IMF, World Bank Database, 2002

Table 5: Comparative aggregate government expenditure as a proportion of GDP 1997–2001

	1993	1998	1999	2000	2001
Eritrea	61.8	81.8	99.6	101.4	78.1
Ethiopia	19.6	30.6	33.0	31.2	29.1
Uganda	18.6	19.0	20.5	21.1	19.6
Rwanda	23.9	18.9	19.7	18.9	21.4

Source: World Bank Economic Country Reports

Table 6: Eritrean Millennium Development Goal indicators (to be achieved by 2010–2015)

	Current	Target
Poverty rate (% of population below \$1/day)	53%	22%
Net primary enrolment rate (grades 1–5)	38%	100%
Infant mortality rate (per 1,000 live births)	61	34*
Child mortality rate (per 1,000 live births)	94	52
Ratio of girls to boys in primary & secondary education	85 : 72	Equal ^a
% Births attended by skilled health personnel	29%	90%
Use of contraception – any method (men)	NA	NA
Use of contraception – any method (women)	8%	25*
% Of population with access to an improved water source	7%	75%

Note: ^a Target is inconsistent in various documents, requiring confirmation of actual targets.

Source: Eritrea Education and Training Sector Note: World Bank Document No. 24448-ERI-A-2002

had to grapple with the gigantic task of reconstruction of damaged roads, schools, hospitals and houses, while rehabilitating displaced refugees and expatriates returning to their homeland. This has placed the country's economy and its meagre resources under severe strain. Yet, Eritrea has achieved significant progress in rehabilitating, expanding and improving its education system (ESDP, 2004). In the first decade after independence, enrolments at elementary level more than doubled from 150,000 in 1991–92 to 360,000 students in 2002–2003.¹ Enrolments at middle school more than tripled from 28,000 to 87,000 students. High school enrolments increased by two and a half times from 28,000 to 73,000 students (ESDP, 2004). This increase coincided with an increase in the number of elementary and middle schools, which rose from 273 in 1991–92 to 747 in 2001–2002. Consequently, the number of secondary schools went up from 19 in 1991–92 to 44 in 2001–2002. Parallel to this development, the government focused on increasing the number of technical schools from one in 1991–92 to ten in 2001–2002. All this expansion in volume and growth resulted in heavy demand for teachers, whose recruitment during this period has gone up from 4,504 in 1991–2001 to ten, 456 by 2001–2002 (Macropolicy, 1994; NEP, 2003). Despite the above-mentioned progress, Eritrea continues to face daunting challenges that relate to access, equity, quality and relevance, besides internal wastage.

Situation analysis and defining the terms of discourse

In its latest document the Education Sector Development Programme (ESDP), which the Ministry of Education has developed after two rounds of consultation with development partners and stakeholders, the government has taken a comprehensive analytical view of the overall development achieved in the last decade and identified the enormous work to be done in the areas that have not yet been fully addressed to in keeping with its discourse in its Macropolicy (1994) and other documents of policy. The ESDP thus offers the government vision for the next five years spanning 2005–2009 over the issues and challenges related to access, equity, quality and relevance. The following six main points summarise the salient features of the ESDP.

- a. Though access to education has been expanding regionally, nearly 255,000 school-age children are not enrolled in any elementary school. Only 40 per cent of school-age children in Eritrea have at present access to primary education, 10.5 per cent have access to middle level education and 13.6 per cent to secondary level education. Only 4.5 per cent of children between 4 and 5 years get pre-school education at the moment, and over 40 per cent of adults are illiterate (NEP, 2003; CIA, 2006)
- b. Disparities exist in access by region, by gender and by level of income. Gross and net enrolment ratios differ widely by region. Whereas the gross enrollment ratio at primary level is about 21 per cent in Sem-Keih-Bahri (North Red Sea Region), the enrollment ratio in Debub region is 100 per cent. Similarly the gross enrollment at middle level education is 20 per cent in Sem-Keih-Bahri (North Red Sea Region) compared to 100 per cent in the Maekel region (central upper highlands). Further, the variations are found to be great within each region too (ESDP, 2004).
- c. The document endeavours to develop strategies to improve equity and access that would ensure educational opportunities to all, to achieve universalisation of education by 2010–2015 by enrolling all children at primary level and 90 per cent at middle level. It would include elimination of gender disparity and promotion of gender parity and gender development. To achieve this, the government is planning to construct classrooms in under-served areas of population, breaking the bottlenecks in the output of trained teachers including increasing the recruitment of female teachers, implementing community based campaigns, raising gender awareness of communities and the teaching force, revising curricula and teaching materials in keeping with gender-sensitive policies, opening boarding schools and hostels for girls in remote areas and ensuring grade I entry at the right age. In keeping with this spirit, the government has brought out a comprehensive policy document titled, *Eritrea: National Education Gender Policy and Strategic Framework of Action* (NEGP, 2004) on gender awareness and promoting gender parity and development.
- d. As to relevance the government wants to lay emphasis on revising the curriculum (which is presently highly academic in nature and modeled on the lines of western education, calling for higher skills of cognition and longer periods of intellectual exercise and stress), to be more relevant to the economic and market needs of the State of Eritrea.
- e. In order to improve quality, curriculum revision with a focus on expected learning outcomes, provision of adequate up-to-date text books, increasing teacher and leader competencies through staff development, providing equipment and ICT

besides developing a system of Monitoring Learning Achievement (MLA) with reference to Minimum Mastery and Desired Mastery Levels (MML and DMLs) are planned.

- f. To minimise the internal wastage of human resources and concomitant costs, the government is working out newer strategies that may help reduce the present rates of repetition of studies and dropout, which at present are very high at all levels of education; these are compounded by regional and gender disparities. About 20–30 per cent of students repeat every year at each grade. This is adversely affecting the gross and net enrolment ratios.

Viewed from an analytical angle, all these reflect the internal disorders and deficiencies broadly arising out of *demand and supply* which are summarised in Table 7.

Getting started with educational reforms and strategies

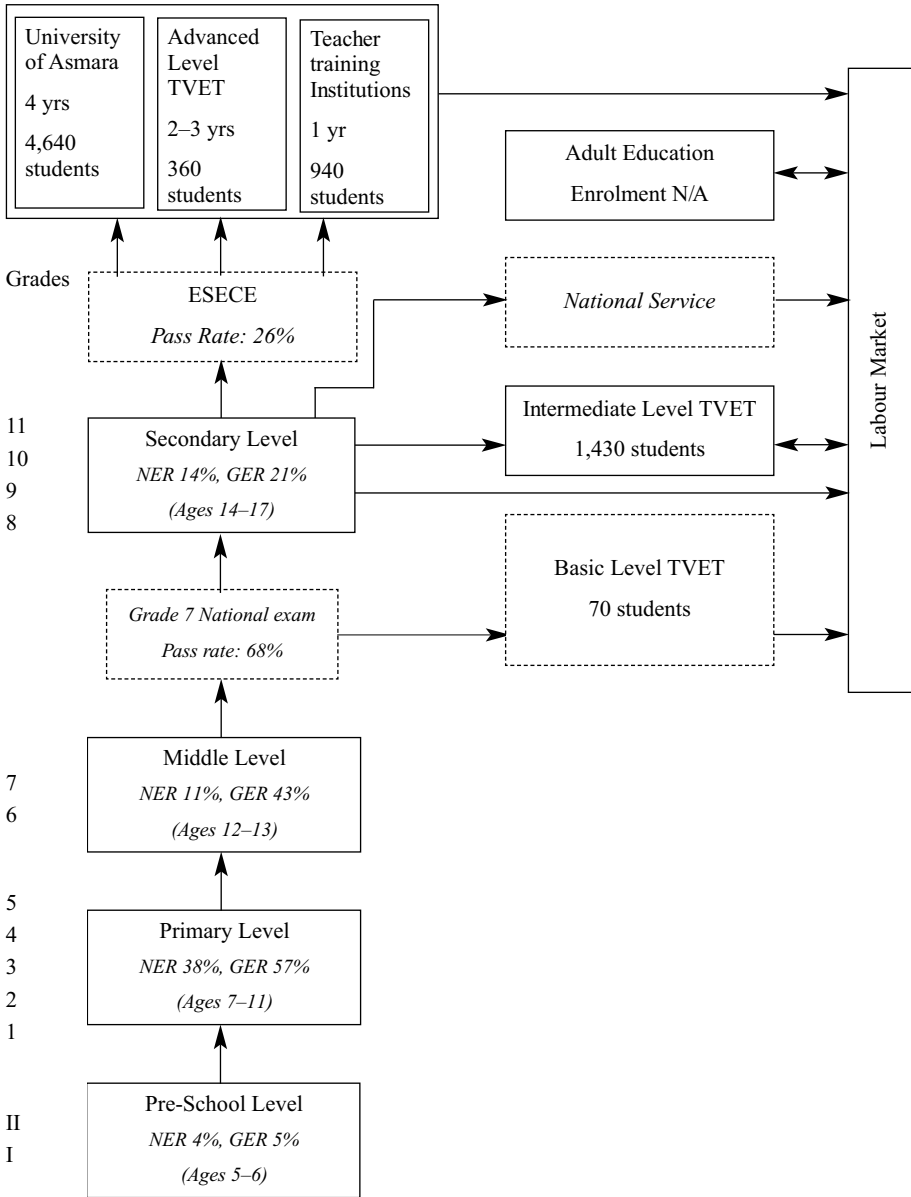
Against this backdrop, the Ministry of Education has come up with a vital document entitled, *Rapid Transformation of the Eritrean Educational System* (RTEES, 2002, see Figure 1), which seeks to address the challenges ahead as a measure of compliance to the guidelines of the World Bank under the *Fast Track Initiative of Education for All* (EFA).

It is to be recalled here that the Government of Eritrea signed an instrument of understanding to implement Education for All during the World Education Forum meeting held at Dakar, Senegal in April 2000. Under this, Eritrea would strive hard to achieve universalisation of primary education by 2010 and gender parity and gender development by 2015 under Millennium Development Goals (Table 6).

The World Bank for its part assured the developing nations pledging to implement *Education for All*, and stating that it would find suitable donors or development

Table 7: Demand and supply affecting the access, equity, quality and relevance

Effects of demand	Effects of supply
Poverty to meet the educational costs	Lack of qualified teachers and trained school managers affecting the performance
Child labour at home	In compatibility of the curriculum to the nation's and society's needs.
Child labour outside earning wages	Delayed delivery of text books
Parents' uninterest in children education	Delay in the revision of the curriculum for all levels (which is now in the process)
Distance of school from home/village	Overcrowded schools, class rooms, running in shifts
Socio-religious and cultural barriers and beliefs such as <i>early marriages for girls</i> , religious and ethical restrictions on <i>girls' movements</i> , belief that <i>girls are inferior to boys</i> , etc.	Teacher : pupil ratio and over load of work for teachers
Costs of present education	Inefficient use of school calendar and delay in meeting the scheduled tasks
Imposition of national service	Lack of alternatives to conventional education
Based on the information given in the ESDP (2004) of MoE, Government of Eritrea	

Figure 1: Eritrea: education and training provision system

Notes: Data refer to 1999/2000: TVET and Tertiary data is 2000/2001. General Education enrolment includes government and non-government schools: TVET enrolment is government only. Private enrolment figures are not available. ESECE: Eritrean Secondary Education Certificate Examination. Adult Education: This includes skills development centres (SDC), illiteracy eradication programmes, and continuing education. Scheme evolved as part of rapid transformation of Eritrean educational system by MOE. Courtesy: Eritrea Education and Training Sector. Note: World Bank Document No. 24448-ERI-A-20024

partners for funding the implementation of the *Fast Track Initiative*. But, at the same time the World Bank imposed certain conditions which make it an obligation for these nations, including Eritrea, to come up with strategic documents of vision so as to eliminate illiteracy and poverty through transformation of what is so far basically an illiterate society into a knowledge-based society through which they would aspire to become economically self-sustaining.

Therefore, RTEES constituted a clear road-map for conventional education coupled with provision for vocational education at every level so as to ensure that the learned and the trained (skilled force) manpower from any level begin to contribute to the national economy through self-sustainable vocations (Figure 1). This was followed by the development of the *Eritrea National Educational Policy* (NEP, 2003) and the *Interim Poverty Reduction Strategy Paper* (IPRS, 2003). The latest strategic document *Education Sector Development Programme* (ESDP, 2004) has given its comprehensive view on the interplay between the Education and Poverty Reduction as follows:

According to Living Standards Measurement Survey (LSMS, 2003) two thirds of Eritreans were unable to obtain sufficient food and other essential goods and services to live a healthy life. More than one third (37 per cent) live under extreme poverty. Poverty relates strongly to lack of basic needs in education (especially literacy level of the household). About 70 per cent of the poor lives in rural areas and rely on low output agriculture and animal herding for their livelihoods. Rural women tend to be less literate and numerate. Nearly 74 per cent have not attended school and about 40 per cent of the left school at an early stage due to early childhood marriages. In rural areas about 45 per cent of the children of the extreme poor were not attending school (compared with a national average of 28 per cent) as they were engaged in various activities to support the family. Households that have the fewest number of individuals with primary education tend to be poorer. This demonstrates that education is crucial to creating livelihood opportunities and diversifying income

In particular, the I-Poverty Reduction Strategy Paper (IPRS, 2003) underscored the need to improve equity and access to school education, completion of basic education, provision for quality basic and secondary education, and reduction of dropouts, as all these measures would positively contribute to the country's economic transformation directly. Eritrea has considerable potential to generate growth in agriculture and livestock production, fisheries, small- and medium-scale enterprises, tourism, telecommunications as well as civil, mechanical and electronic infrastructure (ESDP, 2004).

Against this backdrop, the Government of Eritrea has prepared an all-inclusive ESDP document highlighting basic education and literacy, general secondary education, technical and vocational education and capacity building of the Ministry of Education as four important pillars, and presented to the donors and the development partners with the costs and estimates amounting to US \$200m, of which US\$160m would be investment costs and US\$ 40m recurrent costs. The World Bank immediately approved the same as an IDA-financed project and the Government of Eritrea began implementing it under the title Education Sector Investment Project (ESIP) from October 2003, pending the finalisation of detailed report for the five years 2004–2009. Initially the World Bank's Board approved on May 23, 2003 an Inter-

national Development Association Credit of US\$45m. The Government of Eritrea has pledged US\$20m as its contribution in its letter to the vice president of the World Bank. Many development partners including the European Union, the African Development Bank and Norway have expressed their support to the programme in principle (ESIP, 2003).

With regard to literacy and adult education, the ESDP has envisaged its plan as follows:

The Government intends to strengthen the full range of adult education activities, but during the ESDP period it will concentrate on increasing literacy. The adult literacy and post-literacy programme will be expanded to reach more than 55,000 non-literate and semi-literate adults and youth, and a non-formal education programme will be organized for about 55,000 out of school youth. This pillar also aims to reinforce the quality of and supply of teaching materials and appropriately trained teachers for the adult literacy programme. The specific target is to reduce the illiteracy rate by half. The Principal means include construction of 600 transportable classrooms, greater use of media (especially radio and TV), revision of curricular materials, facilitator training and systematic monitoring and quality assurance.

Further, enormous stress has been laid on the expanding role of media education as a distinct entity from distance education, that embraces both the formal and non-formal sectors to offer equitable access, coupled with quality and relevance to those disadvantaged groups including girls, women and adults as an alternative to conventional education (Macropolicy, 1994; RTEES, 2002; ESDP, 2004).²

The term 'media education' is used here in the same sense as defined by the World Education Forum–UNESCO, Pierre Schaefer, Donald P. Ely and J. Mohanty (Ely (1984); Schaeffer (1984); Mohanty (1994); World Education Forum (2001)), where 'media education' not only acts as a support to open or distance education but also acts as a direct means of education by itself.

For instance in India during the 1980s and 90s, the State Radio of Tamil Nadu and Kerala conducted correspondence courses for teachers by directly broadcasting radio lessons and conducting examinations at the end of the course. Those who qualified in these examinations, conducted by the State Teacher Training Institutes, have been recruited as qualified teachers. The China Radio and TV University has trained nearly 400,000 in various professions and skills, including teachers, in the last decade. Even Japan's NHK Channel, which is the pioneer in Asia in using media for education, has used it as a 'direct alternative' to other modes of education and evolved the first-ever systematic and scientific curriculum on the lines of Europe (Murthy, 2004a). Many French-speaking West African nations – Benin, Burkina Faso, Guinea, Mali and Senegal – have used radio programmes for non-formal and adult education programmes (World Educational Forum, 2002). Pierre Schaefer and Donald P. Ely conceived 'media education' as a 'parallel school' or 'dominant model' confronting the traditional claims of superiority of conventional education. Donald P. Ely has envisaged a much more prominent position for 'media education' in that its role in the visual literacy movement is strongly emphasised.

Therefore, media education in the Eritrean context is conceived to play a large role as a conventional means of education, through direct delivery to inaccessible and disadvantaged groups by offering a variety of courses for formal and non-formal tar-

get groups (for which examinations would be conducted by an accreditation body). It would also offer a supportive role to formal education and adult education programmes such as those offering enrichment through using learning resources and meeting special needs; in so doing direct teaching and curriculum reforms remain unaltered or unaffected (Bates, 1984a; Murthy, 2004b).

Within this context, it is also established that it would be a low-cost alternative and would be very effective in quickly establishing curricular reforms by comparison with distance or open learning education programmes, which are mostly based on print materials and interfacing or interactive (or contact) sessions, or by conventional means of curriculum development through the National Curriculum Development Department (Murthy, 2004a). It means that these radio or TV programmes may or may not be accompanied by the print materials. Only cassettes may be made available through a government-organised distribution system to the target groups. Details of course designs and curriculum for formal and non-formal education, vocational education, teacher development programmes for English and open school education through radio and TV, along with the description of the role of necessary corollary institutions, have been extensively discussed in Murthy, 2004a, b and c, 2006.

It is clear from the enormous budgetary requirements and huge expansion programmes (to be undertaken in the context of the previously identified constraints), summarised in ESDP (2004), that a single conventional mode of formal and non-formal education sectors can hardly meet the requirements of Eritrea, which is so unevenly placed both topographically and climatically. It has also become obvious that in order to achieve the objectives enunciated in the ESDP the government has to plan a three-pronged approach:

1. Leading to quick, simultaneous training and development of teachers/facilitators for both formal and non-formal sectors (Bates, 1984a; Murthy, 2004a).
2. Providing support in the form of learning resources and enrichment to students and teachers (Bates, 1984a; Murthy, 2004a) in the formal and non-formal education sectors; and
3. Offering a clear line of educational channels and avenues for dropouts and adults in the non-formal education sector, making it a more viable, sustainable and life-long continuing education (Bates, 1984a; Murthy, 2004b)

With the preceding in mind, the government found the role of Media Education crucial, and assigned the author of this paper to develop a fully technologically feasible document that could act as a clear road map for the effective formulation and execution of formal and non-formal education through media. What follows here is the theoretical and practical proposition of the road map developed for the implementation of Media Education in Eritrean education (Murthy, 2004a), a research project subsequently completed and submitted to the Ministry of Education.

The present paper is thus part of the series and deals with the first facet of the principles and ideas behind the three-pronged strategy (identified above) that resulted in adoption of media education (independent of the distance education of the ministry's Human Resources Department) as a low-cost, quick alternative to the conventional mode in accessing disadvantaged groups. It is open for a thorough dialogue and discussion for further refinements, if any are necessary.

Media education as an alternative to achieve the objectives of ESDP

The two objectives of media education are:

1. To produce highly skilled or educated manpower (nearly 10,000 teachers for elementary schools and 4,000 teachers for middle schools), and thousands of skilled personnel (to meet its industrial market and agricultural economy) in addition to infrastructure and funds for the construction of 1,915 new classrooms for elementary and 1,060 classrooms for middle school, and three special needs education schools for the disabled by 2010, as shown in ESDP (2003, 2004) and ESIP (2004). This would be very difficult if it were to proceed by conventional means. Hence Media Education has to assume a parallel role (Bates, 1984a; Mohanty, 1999; Murthy, 2004a) (probably direct teaching by media) in addressing all or part of these to help the Government of Eritrea to achieve this major target/goal.
2. To train large numbers of teachers/facilitators (by direct teaching, enrichment, providing learning resources, etc) whilst constructing 600 portable classrooms for non-formal sectors in the shortest time possible, to meet the challenge of transforming the nation's education sector into a literate and production-oriented economy.

In achieving these twin important objectives through media education as an operational system design it is crucial to think about poverty alleviation for sustainable development in the way defined by Harbans S. Bhola, who says:

We have to think of poverty alleviation for sustainable development also as a problem of 'operational system design' – accommodating contexts and conditions, configurations of agents and agencies, and resources covering the material, motivational, intellectual and institutional. And of course we will have to design, implant and implement 'an adult education system' that is comprehensive and commensurate with the needs of the poverty eradication system; and which is fully interfaced with the poverty eradication (Bhola, 2004).

This is precisely the underlying spirit in the design of media-based education programmes for all categories of learners who are out of school that is described later. Already, by launching media-based education programmes for formal and non-formal sectors (in addition to several other parallel educational programmes) developing countries such as India, China, Nepal, Sri Lanka, Niger, Kenya, Zimbabwe, Zambia, Mali, Nigeria, South Africa, Cuba, Argentina, Brazil, Guatemala are moving towards the elimination of illiteracy and reduction of poverty. Both the ADEA (Association for the Development of Education in Africa) and UNESCO have laid stress on the need to resort to media education to produce large number of teachers and skilled workers. They are of the view that training manpower through media would be certainly the shortest and most cost-effective alternative to conventional educational programmes (Ana, 1984; John, 2003).

This paper highlights the importance of revamping and revitalising the non-formal sectors so as to make the communities involved compatible to the mainstream of education by:

- 1 formulating and designing the possible courses for the repeaters and dropouts;
- 2 planning, organising and training the key players involved through media; and

- 3 showing how to hasten the pace at which the reforms in education may be carried further in Eritrea.

Setting parameters of the operational system design

Eritrea has a very good history of running literacy campaigns, which culminated in establishing Zero Schools, offering unstructured literacy and vocational training, that met the objectives of its 30-year armed struggle against Ethiopian rule (Cliffe and Davidson, 1988; Pateman, 1990; Murthy, 2004d). However, there are no data available as to how these programmes focused on literacy, who designed them and for how long.

After independence, the Department of Adult and Media Education, working under the Ministry of Education, has since 1995 proactively pursued several long- and short-term programmes developed by its own curriculum department in conjunction with the National Curriculum Development Department, including preparation of some elementary primers for adult learners. It organised these conventional programmes through its own facilitators, utilising government schools and Community Literacy Centers. At the same time, the Department of Adult and Media Education, through its Bana Radio transmitter, beamed a number of educational programmes related to agriculture, environment, health and early childhood care and development (ECD) to enhance the awareness of health, hygiene and environment among the general populace across the country. But these programmes had limited access and could not cover the whole of Eritrea due to the low power of the transmitter. Recently the government has approved the erection of a 10kW short-wave transmitter with the aid of the World Bank, the commissioning of which would complete access to the whole of Eritrea, making it feasible to broadcast educational programmes through radio throughout the country.

So far all these efforts have targeted the people within the age group 15–45, without any, or with only limited, education. However, there are many bottlenecks, such as the lack of scientific planning, the demands of organising and developing a range of curricula to meet the variety of learners and the lack of homogeneity in age amongst learning groups, all of which have proved to be formidable for the government to surmount. Even now, a decade since independence, there is no specific coursework with due consideration for the needs of and for varying levels of learners. Many problems are confronted by the government in targeting a large heterogeneous group of adult learners in the age range 15–45. The problems are compounded when learners of different age groups come to the same place for their learning.

The primer being followed is a very old and it supports the attainment of only a minimum literacy and numeracy level – in the domain of functional literacy – achieving these levels means acquiring a standard equivalent to the 5th grade of elementary school, though this rating has never been scientifically tested and validated. Of late, some progress is being made in preparing multiple primers in different ethnic languages. Yet, there is much desired that is not addressed in this conventional mode. As there are adult learners of many backgrounds, the government has to develop a range of curricula for meeting their various vocational needs and background interests. The current lack of variety in the curriculum alienates learners from the adult education programme and constitutes a major drawback in provision.

This apart, there is another grey area in the whole of this programme, which centres around the age group of 10–14 years, who do not fall under the definition of either

the Adult Education programmes or are admitted to formal education according to the latest educational policy

Furthermore, none of the programmes offered at the adult literacy level are ever investigated using any form scientific evaluation or testing. Consequently follow-up programmes cannot be identified for specific target groups which may be seriously at risk.

Finally, there is no structured educational planning that would meet a broad spectrum of the society from the grass roots to the national level.

Some proposed new policies

a. Categorising the appropriate age groups

As has been already mentioned above, the Government of Eritrea is treating people younger than 15–45 as a defined target group of adults. Children who are above 10 and below 15 have no means to get admission into formal schools or attend non-formal schools. Therefore it is imperative to effect an important policy change to cover the entire age group 10–45 as the defined target group of adults. In many developing countries including India, which has the world's third largest percentage of illiterates, the ideal age group is around 10–45 years.

b. Curricular reforms through media educational programmes by directly developing scripts on identified curriculum topics

In many African countries such as Niger, Nigeria, Kenya, Zambia, Mali, Zimbabwe and South Africa, curriculum development, enrichment and reforms are being carried out through media education, both formal and non-formal. Therefore they avoid the problem of duplication and cut the time and costs taken for similar reforms via conventional means in which national curriculum development departments of countries normally prepare a new curriculum. Almost all of these countries have used media education for direct teaching in the classrooms as an alternative to the teachers who are not available for certain subjects like mathematics, social sciences, etc. The approach also serves as an alternative to teachers in remote locations where transport is limited.

Further media education programmes (Bates, 1984a; Murthy, 2004a, b, 2006) (see Figure 4) can be prepared by the media department's own curriculum department directly based on the guidelines of script writing that were detailed in ministry document, 'Salient features of the course design and scripts for the curriculum for media educational programmes category II and I'.

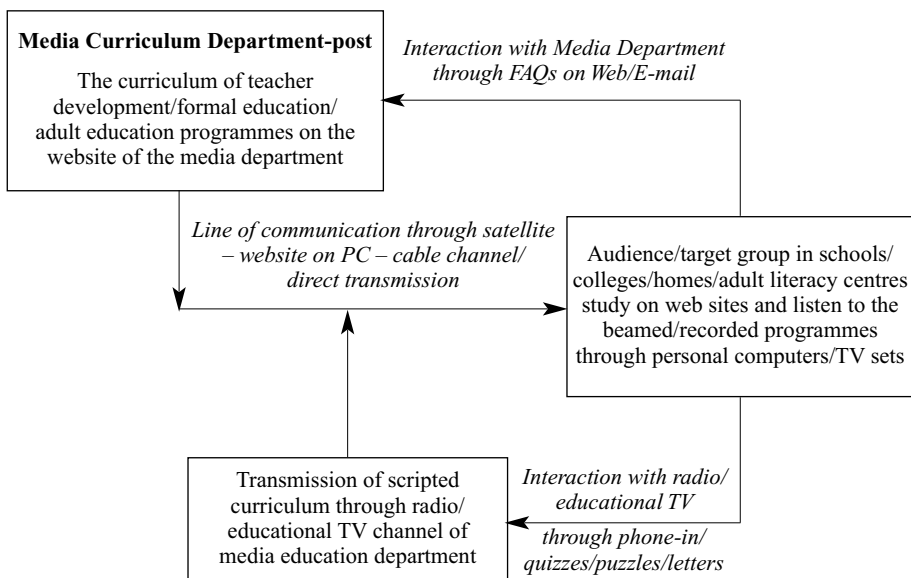
c. Strategy to execute media educational programmes to promote literacy and education

Against this backdrop, adult educational programmes could be structured and divided into the following major sectors:

1. To develop a structured plan of programmes, covering the entire range of categorised learners in the age group of 10–45 years.
2. To train the adult education teachers/facilitators or organisers through the media based distance education programmes (detailed curriculum and scripts based for the production of educational programmes for training of this group will be developed soon and will be reported elsewhere).

Figure 2: Media and ICT role in distance education

(Proposed by C.S.H.N. Murthy, 2004)



3. To train the media education curriculum department personnel in developing suitable curriculum and educational programmes in keeping with the requirements of the target groups.
4. To undertake preparatory work for the production of lessons/units for categorised learners in adult education.
5. To produce the media based educational programmes for different categories of learners and transmit them through networks of low-cost technologies laid down for transmission by radio and TV, and by distribution of video cassettes or CDs through identified outlets with or without accompanying print materials such as pamphlets, brochures, etc. (Murthy, 2004a, b and c).

d. Elaboration of the strategy

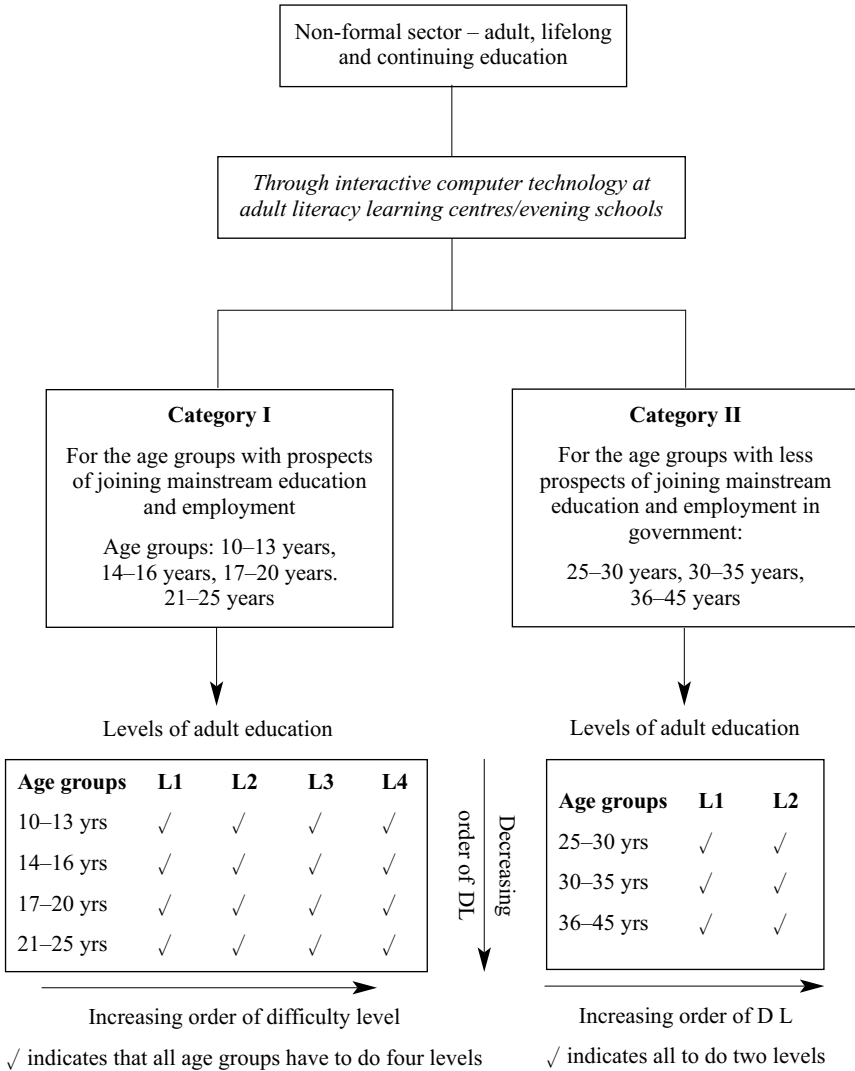
Principles categorising adult education programmes for different levels of learners

In view of the above, a categorisation of the entire range of adult learners is being undertaken as a first step in the direction of structuring the programmes.

1. *Main principle: Categorisation to achieve homogeneity in each group.* The media based adult education programmes, therefore, have been conceived to cover learners of varying levels of age groups, within which each group consists of students of same or similar age range, in order to achieve homogeneity of classroom or target group.
2. *Creating a number of categories based on the same or near age range as each target group.* Thus, there would be the following target groups of learners: 10–13

Figure 3: Flow chart of implementation of non-formal education

(Proposed by C.S.H.N. Murthy, 2004)



years, 14–16 years, 17–20 years, 21–25 years, 25–30 years, 30–35 years and 36–45 years. At the outset this may look like making several categories of adult education learners. But the principle underlying this categorisation has far-reaching implications (see Figure 3) especially in terms of identifying and separating the difficulty levels for preparing educational programmes ideal to each group.

3. *Description of sub principles involved in the categorisation.* Firstly, the learners in the age groups 10–13 to 21–25 have chances to join mainstream education

from any stage, be it conventional education or technical education. By educating these groups there is an immediate benefits both for them and in the nation through increasing productivity. Further, they will be the future citizens of the country and help inculcate the next generation with educational values and contribute to national growth.

Secondly those who are above the age groups of 25 to 45 can sustain themselves very well with functional literacy levels and can help bring their children into an environment of education. Their chances of getting into mainstream education themselves are low. However, if anyone is desirous of carrying forward their education, correspondence courses offered through the national open school and media education are always available. As such for a minuscule population of the age group of 25–45, functional literacy level is reasonable both in terms of need and government spending. In addition, the programmes offered by media education in the form of lifelong education and continuing education will always act as enrichment programmes and refresher programmes without giving scope for relapsing into illiteracy and stagnation of intellectual growth. Categorisation here is based on Bates (1984a).

If the above logic is to be applied consistently then the whole scheme of adult education programmes could be divided broadly into two categories.

- **Category I:** Adult education programmes for the age groups 10–13, 14–16, 17–20 and 21–25, with prospects of joining the mainstream of education and employment in the government sector (see Figure 3 for details).
- **Category II:** Adult education programmes for the age groups 25–30, 30–35, 36–45 with less prospects of joining the mainstream of education and employment in the government sector and can benefit from the media programmes of lifelong education and continuing education for sustainability of literacy levels (See Figure 3)

Salient features of the course design and scripts for the curriculum for media educational programmes

Category I (accompanied by print materials)

Achieving homogeneity in each group and formulating different levels of adult educational programmes

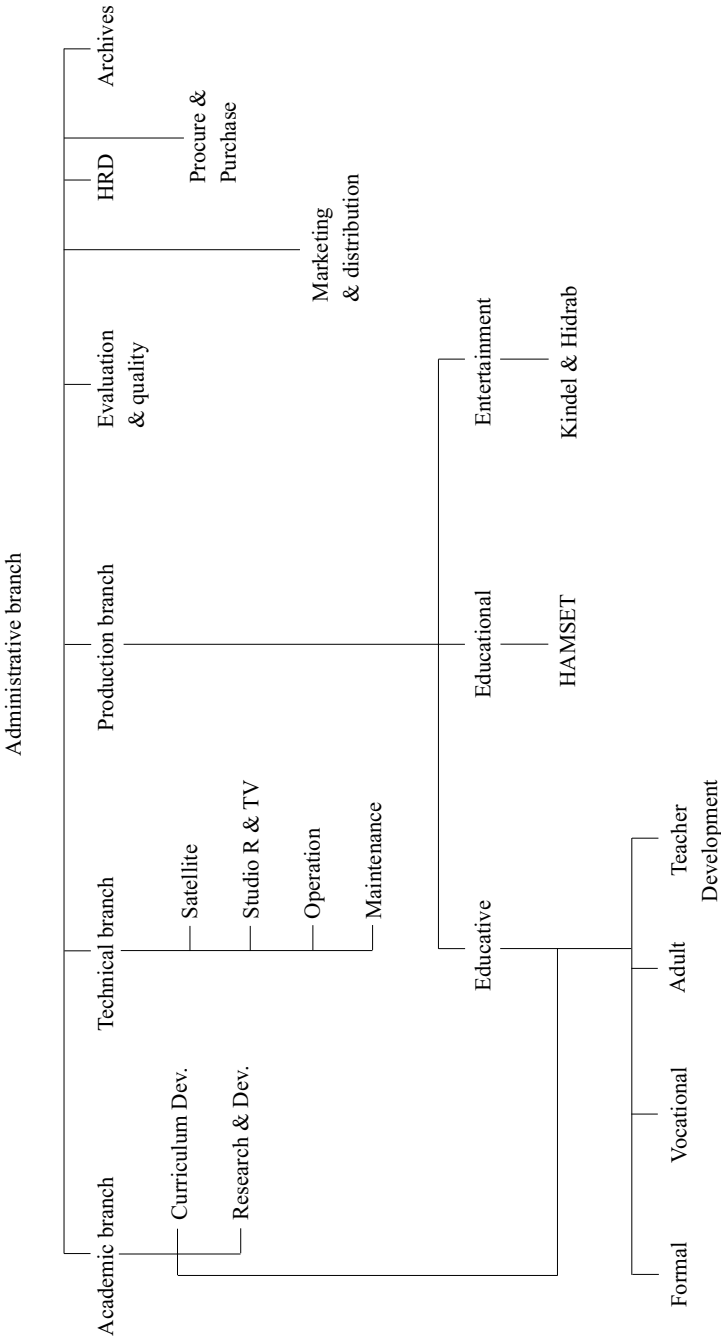
For the purpose of achieving homogeneity, Category I is divided into several sub-groups across a range of age limits. As such they can be assigned to different levels of Adult Education Programmes. For all these age groups to go through an ideal environment of education, it is possible to design the educational programmes as L1, L2, L3 and L4 (See Figure 3 for details).

Guidelines for preparing the course curriculum and evaluation covering all the levels: general

The course and the curriculum for all the above-stated L1 to L4 levels would be prepared, subject to the caveats mentioned here, by the curriculum department of Media Education. Based on the course and curriculum thus prepared, scripts would be prepared for radio and TV by the scriptwriters. All the age groups mentioned above have to proceed through these courses and curricula corresponding to each level to

Figure 4: Media organisation – structure and tasks

(as proposed by C.S.H.N. Murthy)



arrive at a reasonable level of proficiency that stands as a qualifying mark for them to join the mainstream of education at any stage. All of them have to undergo an examination in the written and oral skills at the end of the completion of each level and obtain a certificate of satisfactorily completing it. This is essential to ensure the quality of the programme being imparted. Each level will have each subject with defined general objectives and specific objectives with intended behavioral goals and outcomes. There will be well-planned and realistic course content in each part of the curriculum. Designing of course content should be made in such a way to offer reasonable opportunities for the over all development of the individual personality. There should be a gradual increase in the level of the course content and curriculum in terms of logic, understanding, skill, and difficulty from L1 to L4.

The curriculum must include topics which offer practical experience in their day to day situations and involve their day to day work skills (Probak, 2004). It needs a clear survey of people's local activities and their professional skills. From this backdrop the general principles of science, health and hygiene, and social studies emerge. Examples involving mathematics in day-to-day life situations should form the basis for course content of mathematics. This principle should be carefully adhered to in formulating the course content for levels L1 to L4. There is often a tendency to make the course content and curriculum of the adult education programme too academic and akin to the formal school curriculum by policy developers and bureaucrats who tend to justify it on various grounds. At the end of the day all such adult education programmes become non-starters for the target groups who do not find such material relevant and interesting. The findings of Probak Karim in his study on adult education programmes in Bangladesh are the best basic guideline in this regard (Probak, 2004).

Evaluation and quality assurance:

More often than not, the government and the machinery that implement adult education programmes gloss over evaluation for various reasons. Evaluation of the effectiveness on a pilot-testing basis with a random sample of target groups enables the certification of quality of the media-based educational programmes being broadcast. This could be done by both the media education department and by independent accredited agencies with proper infrastructure to carry out such evaluation. Further evaluation of examination system should be carried out with specific focus on how examinations are being conducted for the learners of the programme at the end of each level. This should include the manner the question papers are set up, the way the examination is administered and the way the learners answered the papers. The examination system for adult education programmes in China, though offered through its Radio and Television University, is quite unique in this respect, and, similarly, Indonesia has a very good evaluation system. Unfortunately such a validation of adult education programmes, with a thorough evaluation and examination system is missing in many third-world countries, including India (see Murthy, 2004a, for details)

Quantum of learning corresponding to each level – curriculum and script planning through media education

This is the most important issue of all. Amidst tremendous stress and debate on the theoretical ways and means of developing suitable and interesting curriculum for adult learners, the following criteria are found to suffice for adult learners. Firstly, local relevance and relevance to their day-to-day life situations should be considered

while developing the curriculum. The content should be inspiring rather than being academic and boring. The difference in the treatment of curriculum, between conventional and media-based learning, should be perceptible and must be exploited to the maximum for the sake of holding the attention of the target group. This requires a good theoretical framework and careful planning of scripts based on the curriculum at each level. The experiences of many third-world and developing nations would help guide the proper formulation of the curriculum and development of scripts for each level.

Attractiveness

Formulating the curriculum for producing the scripts and print materials of the programmes to be broadcast must be attractive, with appropriate visuals and examples corresponding to the age group and level. There should be different introductory scripts, followed by the print materials, for the learners at each level keeping in view the age group of the target groups. Keeping one introductory programme at Level 1 for all the age groups makes the whole exercise futile, as what is attractive for one age group is not for another. The inability to recognise the psychology of the each age group with respect to its educational needs is often a major factor in the failure of adult education programmes at the inception level itself. Many UNESCO studies have proved that educational psychology plays a very important role in adult education programmes.

Illustrativeness

The programmes broadcast must be mostly illustrative, with appropriate anchoring, shooting of locales (corresponding to the scripts) and compatible with the learners' ability to understand. The presentation should be brief, pointed and rely mostly on illustrations. Therefore, there should be a match between content and illustration. Where print materials accompany the videocassettes, they should be heavily illustrated in colour to sustain interest in the learners.

Language

The language used in the programmes and the texts of the accompanying print materials must be very simple and carefully written, avoiding long and complex sentences.

Design

The text should be in a small number of clear fonts and size, and the same design principles applied at all levels.

Scope for exercises

There should be scope for in-built exercises, with all the hints necessary in the programmes broadcast at the end. Exercises should be of different kinds, enhancing the cognition and memory levels of the learners. They should help reinforcement and recapitulation and must lead to the intended learning outcomes or behavioural goals.

Multi-optional approach in languages and courses offered through media educational programmes.

The programmes must be broadcast giving ample options to the learners. If there are accompanying print materials, they should be similar to multi-readers or multi-optional

primers, offering considerable flexibility to learners of different age groups. For each age group, there should be different introductory language programmes followed by print materials to serve as readers. It is not appropriate to offer the same set of courses to all learners in view of the wide range of differences in cohorts. This will not cause any difficulty in the evaluation and examination system as these are based on skills not content. Furthermore, the multiple-option approach will also boost the morale of learners. There would be a wide range of introductory languages and courses available at each level. The learner is open to choose the language reader and the course reader, compatible with his learning attitudes and aptitude. The learner would sit for evaluation and examination in the options chosen and the multi-optional approach would decrease dropout more effectively than the single reader and single optional system.

Curriculum development

Curriculum planning, design and development could be done directly by the Media Department unless the state desires it to be otherwise, though it could be cheaper if done by the former, as curriculum development and script writing both could happen simultaneously. The beamed programmes accompanied by the print materials would reduce the government's expenditure on production of bulky textbooks. While drafting the curriculum, the strategies arrived at from critical reflection on the informal and formal feedback from adult educators and facilitators, as reported in Probak (2004), could be borne in mind. There are commonalities between Eritrea and Bangladesh. These findings would suffice initially, at least in designing the primers of basic skills for category II, and L1 under category I.

Mode of instruction

Direct teaching method – through media, both radio and TV along with print materials.

Language of instruction

Local languages or English medium as the government sees fit.

Scheme of evaluation and examination:

Evaluation and examination can be conducted by an authorised independent board or independent body by oral and written methods. There should be sufficient marks allotted to practical or internal assignments. The result should be combined assessment of both the examinations – internal assignments and annual written examinations.

Alternative channels

Those who qualify in these examinations can choose to continue to the next level or join the mainstream of education either by regular schooling, national open school or privately appearing directly for the National Grade Examination or Eritrean Secondary School Certificate Examination. Alternatively, they can opt to join technical schools below or above 9th grade and become professionals in their chosen field.

Category II: (accompanied by print materials)

This category consists of three age groups, all of which fall outside the sphere of any hope of joining the mainstream of education or government employment. However, there would be only two levels of training and all of them must receive

the training at L1 and L2, both of which should make them self-reliant with regard to functional literacy (see Figure 3). They can be given option to break from the adult education programmes after successful completion of the L1 and L2 levels. They may also have a choice to join the mainstream of education or technical education by appearing for an entrance examination. Both L1 and L2 levels would suffice their day-to-day life needs and ensure reasonable level of literacy, numeracy including computer skills. They can further update themselves by following the programmes of life long education or continuing education that media would keep transmitting from time to time. If need be, to prevent their returning to illiteracy, it is possible to offer them refresher programmes instead of going for L3 and L4 levels.

The designing of the courses and curriculum for L1 and L2 levels for Category II age groups could be different than those for Category I, keeping in view the principles of educational psychology. Therefore the course content and the treatment and approach while presenting on media could still be different in view of the age constraint of these age groups. Each increasing level of age will acquire additional complexities and difficulties, and course and curriculum design should be in keeping with this advanced age. Tastes, attitudes and aptitudes would vary considerably from age to age: a blanket approach is not advisable.

One major task remains as to the whole scheme of adult education programmes: formulating, planning and designing the course and contents of the curriculum by the Media Education Department. A plan of action with or without funding could also be hammered out to meet the challenges in a short time. This would be done at the appropriate time by the concerned authorities after obtaining the necessary mandate from the Ministry of Education. The scheme outlined above thus is in the form of a concept in the offing and is subject to further consideration by the Ministry of Education and the Government of Eritrea.

Laying down policy for the implementation of media education for adult education programmes

From the foregoing, a number of questions arise as to how to organise media education. Firstly there is an existing administrative structure which has employed adult education facilitators whose level of education is low. Further, the existing infrastructure has almost a decade's experience to reflect on the factors which are slowing the implementation of adult education programmes. An effort is under way to consolidate this experience and a plan of action is being hammered out to deal with identified gaps. At the moment, the MoE has only conceived a supportive role for media education rather than a full-fledged independent role. But the above scheme of media education is a comprehensive one for the scientific formulation and implementation of adult education programmes.

Yet, it needs two things:

- a plan of action for the development and implementation of the programme as outlined above;
- a policy framed by the government to give full effect to media education as an independent, rather than a supportive, agency.

In view of the above, the following major decisions have to be taken by the Ministry of Education to translate the above scheme into reality. Firstly the Government of

Eritrea is to conceive the present report as a basis and a step towards according a major role to media education as an independent agency. Secondly it must recognise that a Media Education Department's independent and autonomous standing is pivotal to the whole concept of media education.

Against this backdrop the following policy decisions required to be laid down:

1. Media education should be recognised as a major mode of education to achieve the rapid transformation of education, rather than merely supportive to the existing structure, which has already completed a decade's existence with a tardy progress. The intent here is to achieve quicker progress at less cost.
2. The scheme should include both adult education teachers/facilitators and learners at the same time, to avoid loss of time training the facilitators then their target group.
3. Media education assumes almost a formal role in the Eritrean context such as is conceived for other correspondence cum contact programmes for teachers, technical and vocational education for students, national open school for drop outs etc. The only difference is that here the curriculum, once identified, quickly gets rendered into scripts and programmes to be shot. Printed materials would follow the programmes.
4. This automatically demands a systematic enrolment of illiterates and dropouts at all grass-root levels in a prescribed application form along with their national identity cards, so that a complete dataset may be developed as to the requirements, options and the levels at which media education should be offered. Feedback would be sent to the Media Education Department from the local Adult Education Centres electronically or by post.
5. The beaming of programmes by radio and TV would be done as per the levels identified from the feedback, strictly in accordance with the curriculum developed for each level and subject and their primers or readers.
6. The transmission of programmes should be supported by audio and video cassettes.
7. There should be regular evaluation and examination for each level at the end of the stipulated period.

The above matters need to be viewed by the Ministry of Education, in addition to development of an action plan for rapid curriculum design, and laying down policies for the governance of the scheme.

Preparatory steps or foreground for the launch of media education

Addressing media education on a holistic basis, in the context of developing or third-world countries, is one thing: preparing a launch-pad for its take off in Eritrea is another. The installation of technical infrastructure requires investment as well as the recruitment of technical personnel for launching the media channel, and there is also the need to prepare manpower to meet the software demands of the media channel. So, a lot of groundwork has to be done to ensure that there is suitably trained manpower to perform various tasks without loss of valuable investment or time. Since the educational channel may be launched on radio and TV, which have distinctive features, it is better to discuss preparations separately.

Radio

An educational channel can only become operational if the manpower required for its operations is suitably trained. Preparation for radio educational programmes is different from that for TV. The following steps are very crucial for the launch of the Radio Educational Channel (Andrew, 1986; McLeish, 1998):

1. Awareness programmes

- The unique characteristics of radio in general and their exploitation for the educational programmes.
- The formats of radio – conversation, interviews, phone-in, dramas, songs, single presentation (a radio-talk), group programmes such as children's programmes and especially creating a classroom environment.
- Various roles—as a presenter, producer, writer, character and as director.
- Maintenance of voice levels compatible to mike reading and modulation etc.

2. Workshops for training:

- Conducting workshops for interested participants (teachers, writers, journalists, editors and intellectuals) in writing for radio in general and for various formats in particular: e.g. writing as talking and conveying messages within a time limit effectively.
- Writing for literary and non-literary styles: e.g. poetry and story writing (literary) and non-fiction such as essays. Thematic programmes such as environment creation by background voice and music etc., (especially in the case of history of literature, science and social studies).
- Popular writing (health, agriculture, environment and hygiene) and writing for general educational programmes (women's welfare, children welfare etc.) for life long and continuing education.
- Writing for popular science and social sciences.
- Writing for curricular topics – various ways of developing curricular themes and contents into different formats – how many formats one can develop for a given curricular theme or content – how to determine which is the correct, low-cost and effective one that can be prepared in the shortest possible time.

3. Training programmes for special planning for radio:

Writing for print and writing for radio are not the same. This is significant in respect of educational programmes, for one needs to plan special effects associated with theme and content. Script preparation and presentation both should go together with careful and special planning. For instance the Radio Mathematics Project of Nicaragua lays great stress on the special planning they have done in developing the project as a role model for all third-world countries.

4. Training for radio planning of curriculum (compatible to its characteristics)

The curriculum prescribed by the state must undergo modifications in view of the limitations imposed by a medium like radio. Therefore, the way to plan the curriculum, to enrich it and use it both for direct teaching and non-direct teaching, including as a learning resource would need to be dealt within the programme.

Television

Educational programmes for television sharply differs from radio – TV offers both audio and visual information: it has all the values of photography and cinematography. Viewers the world over apply established, demanding norms even to educational programmes. Unless production values comparable to mainstream TV or cinema are applied, the effort to produce educational TV may be wasted – viewers will switch off or entirely ignore programmes. Just as writing for radio is not the same as for TV, planning TV educational programming is not the same as planning for radio. Precisely put, someone who has a background in cinematography can produce an educational programme, but someone who produces educational programmes cannot shoot a film. Familiarity with the entire range of cinema production is essential for producing educational programmes. Scriptwriting for a TV educational programme is possible only if one is familiar with limitations of the camera lens (Combes and Tiffin, 1978; Swain, 1981). One must know precisely what can be translated to a film or composed into a frame – this calls for a special eye and orientation. The following steps could help train manpower before launching an educational channel.

1. Awareness programmes:

- Advantages of TV both as an audio and visual medium.
- Cinematographic techniques – planning film production (cost–value in relation to time), shooting schedules and direction values.

2. Workshops for training:

- Television scriptwriting, including language skills for brevity and presentation.
- Selection of materials and locales (including selection of background scenery, images and photographic pictures or paintings etc.,
- Theme development – formats like drama, abstract anchoring (anchor not seen on the screen) or concrete anchoring, documentary etc.

3. Training programmes for special planning for TV:

- Planning special effects or special materials—settings, photographs, painting, pictures including graphics and sound and light effects.
- Script preparation for the above.

4. Curricular planning for TV

- Curriculum planning techniques compatible with the special features of TV.
- Criteria to divide and subdivide or combine the units of the curriculum to develop it into a single theme.
- Ways and means to enrich the curriculum—curriculum reforms—developing learning resources for teachers.
- Formulating curricula compatible with TV for various correspondence courses of teacher education, and national open school/TVET/adult education programmes.³

Designing educational and interactive computer technology

The popular criticism of the limitations of distance education, as documented by Ljosa (1992, 1998) is well known. At the same time the history and evolution of distance

education, as characterised by correspondence courses and by the features of 'industrialisation' and privatisation of 'institutional learning' compared with 'conventional learning', have offered it a great resilience and the strength to withstand all such criticism. In the process, arguments have emerged both in favour and against combining distance education with educational technology to give distance education a conventional touch, permitting a two-way flow of communication between the teacher and the student similar to classroom experience (Keegan, 1986, 1995; Holmberg, 1986).

However, eminent scholars like Garrison and Shale (1987) argued against laying undue emphasis on the technical term 'distance' and trying to explore the demerits of it on the basis of the physical separation of teacher and student. They favour emphasis on 'education', albeit non-contiguous. However, they too argue in favour of two way communications between teacher and student: to achieve this they advocate the use of technology to mediate the necessary two-way communication.

Citing the Wedemeyer (1981, 1984) model, (the first to identify the crucial role of the communication mode in distance education), 'Teaching and learning can safely and effectively be carried on with no loss of interaction, through various communication means, even though the teacher and learner are separated in space and time', Garrison and Shale sought to make the model more participatory and distinctive. Their model is based on the premise that there is no two-way communication process in the conventional correspondence course education offered through distance education. As a remedy they propose that the teacher generates information which is captured by some enduring medium (such as print, audio-tape, laser disc etc.). The medium carries the content forward to the student who may then be regarded as having received information. The 'negotiation of meaning' required to close the communication loop is an activity separate from the transmission of information, and is frequently supported by a medium different from that used to distribute the content. The negotiation clearly will be mediated by a technological medium, and depending on the technology, exchanges may either be delayed or direct. It is, however, the communication loop that unifies the concepts of distance (with its focus on technological structures) and education (with its focus on instructional activities), as illustrated in Figure 2. This design, developed by the author, will meet not only the above arguments but also reflect the way educational technology and media could be combined to bring education closer to learners' minds.

Garrison has described and discussed the various distance education technologies from the perspective of their communication characteristics.

Two-way communications technology, consists of three generations or distinct types – print (correspondence), telecommunications (teleconferencing), and computer based. Though media education through radio and television, as pioneered by the British Open University and Japanese Educational Radio and Television (NHK), is considered an advance, it still lags far behind the conventional educational experience (Bates, 1984b). The print mode complementing distance education programmes characterised by correspondence courses needed something else to add to make the communication loop complete. The use of telecommunications in distance education marked a new generation in fulfilling the definition of educational methodology of the correspondence courses offered through distance education, even by radio and television. The second-generation technology of telecommunications such as teleconferencing has come to play a lead role in complementing the efforts of media education. Its ability lies in its two-way communication among several individuals at a time. Telecommunication channels may be simply telephone and cable transmission

or innovations such as satellite and fibre optics. Combined with media, as expressed in Figure 2, the advantages are numerous and impact is much higher.

Teleconferencing

There are two primary kinds of teleconferencing: audio and video. From an instructional standpoint both of them are capable of providing group interaction. The dynamics of the group are often essential to explore and convey aspects of certain curricula. It also provides opportunities for social support and informal evaluative comparisons among the students, with the further advantage of being close to the conventional system of education, where the teacher deals with a group more than an individual student. Hence it gains acceptability easily among teachers who usually offer resistance to any modernisation or innovation which would threaten their role as a dominant character in an educational situation.

Audio teleconferencing is currently the most prevalent form of teleconferencing in distance education. Its cost effectiveness is a big advantage. Hardware costs are relatively low and equipment can often be obtained on lease for pilot trials. The salary/wage costs of instructors compare well to those of conventional teaching, and time and money spent on instructors almost parallels a conventional teaching system, as does curriculum and delivery of instruction. Long-distance charges are likely to affect cost inputs, but if counselling centres are located close to target groups, these could be minimised. If the number of students involved in the exercise is relatively small, audio-teleconferencing is justified and acceptably low cost.

Video-conferencing is a more complicated and costly exercise than audio. Two-way exchange of video images between two or more sites and three or more individuals complicates the technological process, though it does allow direct eye-to-eye contact between student and teacher, just as happens in the educational setting. Therefore, to reduce costs most video-conferencing techniques apply one-way video-conferencing where the students only can see the teacher, though keeping the audio connection two-way.

Computer based educational technology (CAL, CML, ICAL & Cyclops)

Association of computer-based learning with conventional classroom learning has become common. However, this has not induced as many innovations in the teaching and learning experiences of students as distance education. Most technological innovations and advancements have found their place only through correspondence course studies and distance education (Baath, 1984; Bates, 1984b; Gerhard, 1992; Torstein, 1992).

Distance-education communication through computer-based technology is of two types. The first is the transmitted or on-line mode, in which the computer is integrated with telecommunications technology. The second type is the local or off-line mode. Together they offer the distance educator an enviable range of teaching opportunities, methods and techniques. Of the two, it is the transmitted mode which has the most immediate application in distance education. This allows computer conferencing, electronic mail, access to electronic databases and administrative contacts such as online application for admissions and examinations etc. The online mode will support expanding services, available to the distance educators and learners. This would further reduce enormous manpower employment (Torstein, 1992).

Using the computer in local mode offers great promise in the future for distance education. It can supply packages of materials or learning kits and tools to the individual learner, which he or she may directly control. This is now being evolved as computer managed learning (CML). CAL, CML and intelligent computer-assisted learning (ICAL) will all be important tools in distance education.

Cyclops

This is a microcomputer/processor-based technology which can be operated easily by people unfamiliar with computer operations. It enables teachers to create their own sophisticated audio-visual materials very simply without programming skills. It converts digitally simple color video graphics – handwriting, text, diagrams and very simple animation—into sound codes. These graphics can be very easily generated using a combination of a standard computer key board and an electronic light pen which writes on a standard television screen or an electronic writing pad which also displays graphics on the TV screen. Still images from a video camera can be similarly coded. As the video signals are converted into a sound-code, they can be stored on audiocassette or transmitted down standard telephone lines, then decoded back into a video signal. Using either standard stereo audiocassettes or two telephone lines, full sound can be synchronised with the visuals.

This system has been successfully used by the British Open University and its associated schools to run the distance education programmes' tutorials. Cyclops is basically a 'peripheral' system for a standard microcomputer, since its core can be made available as a cartridge or a ROM to be added to a standard microcomputer. The probable configuration for a Cyclops is to consist of a standard television receiver, a stereo-cassette player, a microphone, a light pen, or an electronic writing pad and a standard microcomputer.

Sustainability of media education: sensitising stakeholders, community leaders and development partners

Media education is an excellent alternative both in terms of cost-effectiveness and rapid transformation of the state education and economy. But the question of funding the whole range of programmes that media education can offer is sometimes very disillusioning. However, if media education is to be sustainable, the Ministry of Education must look at alternative ways of raising the funds for the programmes to continue. With state expenditure touching 90 per cent of GDP (see Tables 5,6), it is not possible for the government to spend heavily on this core sector for a long time. At the same time it is not possible for the government to do away with this crucial idea of far-reaching economic importance for want of funds. Nor can the government implement the programmes of media education in a limited way as they do not lead anywhere and the objectives of EFA can hardly be realised. The ESDP document amply reflects the enormous budgetary requirements necessary to achieve the objectives of EFA and the millennium development goals of the World Education Forum through conventional means. Yet it is not certain to accomplish them by the said deadline by 2010 or 2015. Hence, media education sustainability is crucial.

1. One of the most promising routes towards making media education financially viable and long lasting is to open the doors of privatisation, providing scope for

advertising. Revenue from advertising both on Bana Radio as also on the state-run radio and TV can help media education become self-sufficient. But being a small state, the possibility of Eritrea garnering high revenue through advertising appears to be bleak: business development in Eritrea is in its infancy. Most businessmen are small traders a long way from building big business houses. Many multinational firms may not find Eritrea an ideal place for any business investment, although some big business organisations in Europe and the UK or the US could sponsor some advertising programmes on philanthropic grounds as Eritrea is a newly formed country and requires a lot of international support. Whatsoever may be the way of raising funds, Eritrea can ill afford to lose an opportunity at the present time.

2. To further the cause of adult education, programmes of Category II should be linked to economic prospects. Adult education programmes linked to individual prosperity would last a long time. Examples such as the Indian Cooperative movement, especially self-help groups of Women in Gujarat (Anand Milk Co-operative), Andhra Pradesh (Dwakra-self help groups) and Rajasthan and Guatemala (Q'bechi Indians' cultivation of pergamino seeds as a cooperative movement) offer a great insight into the economic factors that motivate rural learners to go in for adult education programmes on a lasting basis.
3. In view of the magnitude and enormity of the problems confronting adult education, it is proper for the government to involve NGOs (development partners), acting with community leaders in this gigantic and daunting task both for reducing the government's costs and improving implementation. Without involving development partners and sensitising stakeholders any government could hardly make headway. However, for the present, the Government of Eritrea has expressed its intention to open the doors for privatisation in the sector of general education and technical and vocational education (NEP, 2003; ORC, 2003; ESDP, 2004). If this becomes a reality the advertisements from private educational institutions will become a major source of revenue. As such, some international schools in Asmara are offering advertisements in *Eritrean Profile*. This only points to a ray of hope on the horizon. Further, consumer products would seek to advertise on the media educational channels. All that is required is to employ marketing agents on a commission basis to garner the advertisements.

This should improve the self-sustainability of a most vital instrument of reforms – media education. The earlier it happens, the greater the savings for the state exchequer, which can apply saved funds to other development activities.

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Notes

- 1 Until a proper census is completed one cannot place too much reliance on statistics related to the estimates of school-age population, such as enrolment ratios by level. They act as indicators at best.
- 2 It must also be mentioned that the Ministry of Education has established a separate Distance Education wing under the Human Resource Development Department exclusively to cater to the Teacher Training programmes *'to train and upgrade the unqualified teachers and to address the shortage of elementary and middle school teachers and improve the quality education'*. Probably funding of development partners could be one reason for this separation.
- 3 The curriculum for the correspondence courses for all programmes including adult education programmes could be developed without prior formulation by the state as in American Samoa, Brazil etc.